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BY ECF

Honorable Valerie E. Caproni
United States District Judge
Southern District of New York
40 Foley Square
New York, New York 10007

Re: United States v. Kevin Johnson
15 Cr. 565 (VEC)

Dear Judge Caproni:

We write in response to the Government's letter dated May 6, 2016. As the letter states, the Government seeks, at trial for 18 U.S.C. 922(g), to elicit testimony from a representative from the Office of the Chief Medical Examiner (OCME) regarding two conclusions generated by the Forensic Statistical Tool (FST): that it is 156 times more likely that Mr. Johnson's DNA was present on one swab of the firearm along with that of an unknown, unrelated person than two unknown unrelated persons, and that it is 66 million times more likely that another swab of the firearm contained the DNA of Mr. Johnson and two unknown, unrelated persons than three unknown unrelated persons.¹

The DNA about which the Government seeks to introduce testimony is derived from samples of very low quality, to which there is evidence of multiple contributors whose individual genetic profiles cannot be deduced, and which are comprised of very low template amounts of biological material: 175 picograms (pg) for the "strap", and 119pg for the "slide." This represents the aggregate amount of DNA from not more than twenty-five cells, and seventeen cells, respectively. These samples provide the least source material from which to draw reliable conclusions. All genetic alleles have a distribution in the population at large, and Mr. Johnson has alleles in common with those seen in each sample. However, approximately ten to thirty percent of his alleles are absent from each of the samples for the strap, and approximately a third of his alleles are not present in each sample for the slide. Focusing on the strap, even combining the sample runs, approximately ten percent of his profile remains absent from the mixture.

¹ We assume that the Government's May 6, 2016 letter was not intended to serve as complete expert notice pursuant to Rule 702.

Conventional reporting would exclude Mr. Johnson as a contributor or, at best, fail to reach a conclusion.

Maintaining focus on the strap, it is not the object of FST to claim a “match”, as Mr. Johnson is not a match to the sample. Rather, the program generates a likelihood ratio (LR) comparing the prosecutor’s hypothesis that, along with two unknown (and to our knowledge, unspecified) contributors that despite the evidence of his exclusion, he *is* included in the mixture, but that his missing alleles have “dropped out”, with a putative defense hypothesis that three unknown, and to our knowledge, unspecified contributors are the source of the sample. The product, the software’s conclusion that it is 66 million times more likely that the prosecution’s theory is true over its version of the defense, is both highly misleading and not helpful to the jury. How the poorest quality DNA results – results that cannot be considered a match – could produce a number evincing such profound certainty calls for caution and thorough examination.

As extensive and ongoing research in the field has shown, LR algorithms are highly sensitive, and can be influenced to several orders of magnitude by seemingly minor changes to input variables. Precisely what those variables are, and how they interact, is a question that can only be settled by revealing the source code: the true algorithm by which the LR is calculated – not by pointing counsel to other software, not by scouring articles describing the software or formula in general terms, not by combing the validation results of the software’s testing for evidence of its failure. The question presented is simply this: Whether the precise method by which LRs have been performed may be reviewed by the person against whom the Government seeks to introduce them in a criminal case. The answer is undoubtedly yes.

In order for the Government to introduce FST results, given the extremely complicated mathematics embedded in the program, they must show that the approach OCME applied to the samples in this case is admissible under the Federal Rules of Evidence and Federal Rules of Criminal Procedure. This is an inquiry for the Court to perform, in Your Honor’s role as ‘gatekeeper,’ to ensure that scientific and technical evidence remains helpful to the jury under Rule 702. Thus, the Government’s argument that the entire matter can be addressed on cross-examination misstates the standard in an attempt to lighten its burden as proponent of the evidence. The OCME’s approach to non-deducible mixtures in Mr. Johnson’s case must meet the threshold of Rule 702 before any such evidence can be presented to a jury. Were it otherwise, the Court’s gatekeeping function would be rendered meaningless.

Similarly, the Government makes much of state court decisions decided under a wholly different legal standard for admission of scientific evidence, that of “general acceptance” articulated in Frye v. United States, 293 F. 1013 (D.C. Cir. 1923). As this Court is well aware, the federal courts have not followed that standard for nearly twenty-five years, since the decision in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993), which affirmed that it is the text of Rule 702 that controls the introduction of expert testimony, a rule which makes no textual reference to “general acceptance” whatsoever. While Daubert is commonly referred to as a “more liberal standard”, see United States v. Williams, 506 F.3d 151, 162 (2d Cir. 2007), nothing in the decision binds the district court to accept the claims of the proponent as to reliability, or to acquiesce to the purported expert. To the contrary, the Court was careful to affirm the gatekeeping authority of the district court. “We recognize that, in practice, a

gatekeeping role for the judge, no matter how flexible, inevitably on occasion will prevent the jury from learning of authentic insights and innovations. That, nevertheless, is the balance that is struck by Rules of Evidence designed not for the exhaustive search for cosmic understanding, but for the particularized resolution of legal disputes.” Daubert, 509 U.S. at 597 (internal citations omitted).

The Second Circuit recognized that the Daubert standard “did not abrogate the district court’s gatekeeping function.” Williams, 506 F.3d at 162 (citing Nimely v. City of New York, 414 F.3d 381, 396 (2d Cir.2005)). “Nor did it ‘grandfather’ or protect from Daubert scrutiny evidence that had previously been admitted under Frye.” Id. (internal citations omitted). “Thus, expert testimony long assumed reliable before Rule 702 must nonetheless be subject to the careful examination that Daubert and Kumho Tire require.” Id. This is perfectly sensible as the Frye and Daubert standards are meaningfully distinct and thus must be evaluated differently. The Federal Rules of Evidence demand an examination of the relevance and reliability of all scientific evidence, before it is presented to a jury, regardless of whether it is novel or not. Here, of course, the LR paradigm is novel, has the potential to mislead, is highly confusing, and is ultimately not helpful to the finder of fact in assessing the evidence. To the extent that Frye and its progeny remain relevant, however, it is that “general acceptance” is one of the five non-exclusive and non-exhaustive factors articulated in dicta of the Daubert decision. Thus, the fact that some state courts have deemed FST “generally accepted” does not foreclose its full examination under Rule 702.

In suggesting that the defense and its experts have access to other software that can calculate alternative LR results, the Government fundamentally misconstrues the burden of proof, as well as the burden incumbent upon it as the proponent of the evidence to establish FST’s admissibility. Here, the Government seeks to introduce evidence and testimony derived from FST algorithms and software against Mr. Johnson at his criminal trial. This is not a civil action, and the Government cannot in any way shift onto Mr. Johnson a burden to prove his innocence. Their proffered evidence is subject to inspection and testing under Rule 16, and confrontation under the Sixth Amendment. Further, it is not a legitimate counter to an admissibility challenge for the proponent to suggest that the opposing party can admit comparable evidence of their own. Other than narrow circumstances imposing a duty to provide notice of the affirmative defenses of Insanity, Alibi, or Public-Authority, there is no basis in any rule of criminal procedure or evidence, and certainly not Rule 702, to shift the burden from the proponent because the proffered evidence is proprietary, because it is highly technical, because it originates in forensic DNA, or for any other reason. The argument should be disregarded. For FST results to be admitted, the Government must meet the standards for scientific evidence set forth in Rule 702. See Daubert, 509 U.S. 579.

In addition, the Government’s letter attempts to parse the summary of material questions raised in our letter of May 4, 2016 letter beyond recognition. As we have consistently argued, understanding what FST is designed to do is not sufficient to evaluate whether it reliably performs that function. Published materials discussing FST’s approach to calculating the LR do not answer this material question. For example, regarding sample size, our question is not whether the OCME is *allowed* to test at particular intervals beyond FST’s validation. The literature states that FST “interpolates” to different template sizes, as it must have here given the

lack of concordance between the template sizes of the samples in Mr. Johnson's case and the template sizes for which FST was validated. The material questions are what "interpolation" means in the source code, how that translates into the LR formula that was employed here, and how that impacted the LR. The answers are embedded in the source code.

Likewise, the National Resource Council's discussion of the theta correction for population genetics does not illuminate how the FST code actually accomplishes such an 'adjustment.' Determining whether it does so accurately and reliably is central to the challenge at hand. Only the source code will reveal the weighting, assumptions, and effects assigned to each variable in the complex LR algorithm as it is actually calculated by FST. The OCME has no recognizable interest in concealing this formula from Mr. Johnson.

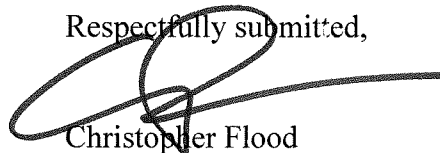
It bears reemphasis that this is a relatively simple matter of constitutional confrontation. The OCME, fiercely defending a code for which Mr. Johnson has absolutely no proprietary, pecuniary, or competitive commercial interest, would seek to deny him the most direct, clear, and reliable source of evidence of the means by which the LR was produced in his case. The Government advances this effort. We firmly object.

Finally, as a general matter, it should be noted that the number of cases in which FST has been employed, used, or previously admitted should have no bearing on an initial assessment as to its reliability. There may be scientific processes where proof of successful operation over time stands as evidence of reliable design – the inner workings of a calculator may not be subject to close scrutiny, but if it consistently adds $2 + 2$ and produces 4, it is strong evidence that it works. This is not the case in the field of LRs. Because LRs are not grounded in objective truth, but are, instead, comparisons of hypothetical scenarios, they simply cannot be "road tested" through performance. This inherent resistance of LR algorithms to conventional forms of scientific evaluation is a key tenant underscoring open source code, data sharing, and comparative analysis in the developing field of LR reporting. Whatever application FST has been given in the past, it still must be demonstrated to be admissible under Rule 702 in this case.

Here, the defense has articulated how the source code meets the standard set forth in United States v. Nixon, 418 U.S. 683, 700 (1974) for a subpoena to be issued in accordance with Federal Rule of Criminal Procedure 17. After reviewing model protective orders available in the District of Delaware, and elsewhere, we have attached a proposed protective order, adapted from an order. In light of the ample security that it affords, the OCME's effort to conceal the LR algorithm employed in this case has no reasonable justification.

For these and all the reasons previously discussed, a subpoena for the source code should be granted.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Christopher Flood", is written over the typed name.

Christopher Flood
Sylvie Levine
Assistant Federal Defenders